

ILLUSTRATIONS.

*

PLATES—PART I.

	Facing page.
SPORT FISHING IN CALIFORNIA AND FLORIDA:	
Plate I. (1 and 2) Angling for black sea bass, Santa Catalina Island, California	208
II. (3) Weighing a big sea bass. (4) The record bonito, Tuna Club, 1908, rod and reel	208
III. (5) Angling for tuna, Santa Catalina. (6) Leaping tuna caught with rod and reel at Santa Catalina	208
IV. (7) A day's sport at Santa Catalina Island. (8) The yellow-tail anglers of Avalon Bay, California	208
V. (9) The record sunfish, Santa Catalina. (10) A salmon (rod and reel) catch, Del Monte, California	208
VI. (11) Swordfish, yellow-fin tuna and yellow-tail, caught with rod and reel at Santa Catalina Island. (12) Amberjack, caught at Palm Beach, Florida	208
A METHOD OF LOBSTER CULTURE:	
Plate VII. (1) General view of houseboat and floats. (2) Inside of rearing box toward one corner	240
VIII. (3) Floats from outer corner looking forward. (4) One of the outside floats, car raised	240
IX. (5) Transferring fry from one car to another. (6) Feeding the fry	240
X. (7) Method of counting fourth-stage lobsters. (8) Improved towing car	240
XI. (9) Lobster with eggs	240
THE FISHERIES AND THE GUANO INDUSTRY OF PERU:	
Plate XII. (1) A characteristic scene on the coast desert. (2) Mouth of the River Rimac near Callao	366
XIII. (3) Gathering oysters from the mangrove trees, Tumbes. (4) Native fisherman in the surf, throwing the ataraya (cast net)	366
XIV. (5) A Peruvian fishing with hook and line from a caballito, Pacasmayo. (6) Balsa on Lake Titicaca, made of reeds	366
XV. (7) Drying sharks, guitar-fishes, etc., without the use of salt, Lobos de Tierra. (8) Sacking guano to be shipped by anda-rivel (automatic trolley), Ballestas Islands	366
XVI. (9) A very small portion of a flock of cormorants on the south island of the Chinchas. (10) A small flock of cormorants on the south island of the Ballestas, gannets barely distinguishable on the ledges	366
XVII. (11) Pelicans on their nests, Lobos de Afuera	366
GOLDFISH AND THEIR CULTURE IN JAPAN:	
Plate XVIII. Wakin	398
XIX. Ryukin	398
XX. Ranchu	398
XXI. Oranda shishigashira	398
XXII. Demekin	398
XXIII. Deme ranchu	398
XXIV. Watonai	398
XXV. Shukin	398
XXVI. Shubunkin	398
XXVII. Kinranchi	398

COMMERCIAL SPONGES AND THE SPONGE FISHERIES:		Facing page.
Plate XXVIII.	Specimen of rock from sponge beds off Anclote Key, Florida.....	403
XXIX.	(1) Diving boat, with cured catch. (2) Diving boat hauled out.....	446
XXX.	Rock Island sheepwool sponge.....	512
XXXI.	Same	512
XXXII.	Florida Key sheepwool sponge.....	512
XXXIII.	Matecumbe Key shaepswool sponge.....	512
XXXIV.	Nassau sheepwool sponge, Bahama Islands.....	512
XXXV.	Abaco sheepwool sponge, Bahama Islands	512
XXXVI.	Cuba sheepwool sponge.....	512
XXXVII.	Florida Key yellow sponge.....	512
XXXVIII.	Same	512
XXXIX.	Same	512
XL.	Anclote yellow sponge.....	512
XLI.	Same	512
XLII.	Bahama yellow sponge	512
XLIII.	Same	512
XLIV.	Cuba yellow sponge.....	512
XLV.	Florida velvet sponge.....	512
XLVI.	Bahama velvet sponge.....	512
XLVII.	Cuba velvet sponge	512
XLVIII.	Anclote grass sponge	512
XLIX.	Florida Key grass sponge	512
L.	Same	512
LII.	Same	512
LIII.	Bahama grass sponges.....	512
LIII.	Cuba grass sponges.....	512
LIV.	Florida glove sponge.....	512
LV.	Cuba reef sponge.....	512
LVI.	Bahama reef sponges.....	512
LVII.	Cuba hardhead sponges	512
LVIII.	Florida wire sponge	512
LIX.	Same	512
LX.	Turkey cup sponges, Mediterranean Sea.....	512
LXI.	(1) Turkey solid sponge, Mediterranean Sea. (2) Toilet sponge, Mediterranean Sea.....	512
LXII.	Toilet sponge, Mediterranean Sea.....	512
LXIII.	Philippine toilet sponges.....	512
LXIV.	Zimocca sponges, Mediterranean Sea.....	512
LXV.	Honeycomb sponge, Mediterranean Sea.....	512
LXVI.	Elephant-ear sponge, Mediterranean Sea	512
A PRACTICAL METHOD OF SPONGE CULTURE:		
Plate LXVII.	Sponges growing on cement triangles used in experimental plants of cuttings.....	547
LXVIII.	Cement disks with cuttings mounted, showing spindle and wire attachments.....	566
LXIX.	(1) Sheepwool cutting about size recommended for planting. (2) Sheepwool sponge about 11 months old, grown from cutting.....	586
LXX.	(1) Sheepwool sponge 20 months old, grown from cutting. (2) Yellow sponge 21 months old, grown from cutting.....	586
LXXI.	Sheepwool sponge 31 months old, grown from cutting.....	586
LXXII.	Sheepwool sponge 35 months old, grown from cutting.....	586
LXXIII.	Sheepwool sponge 52 months old, grown from cutting.....	586

ILLUSTRATIONS.

VII

A PRACTICAL METHOD OF SPONGE CULTURE—Continued.

	Facing page.
Plate LXXIV. Sheepwool sponge 35 months old, grown from cutting.....	586
LXXV. Sheepwool sponge not over 48 months old, grown from cutting.....	586
LXXVI. Sheepwool sponge not over 48 months old, grown from cutting.....	586

PLATES—PART 2.

FISH-CULTURAL PRACTICES IN THE UNITED STATES BUREAU OF FISHERIES:

Plate LXXVII. (1) Brook trout eggs on tray, just beginning to hatch. (2) Brook trout fry in trough, sac stage. (3) Brook trout fry, sac nearly absorbed, about ready to feed.....	699
LXXVIII. (4) Hatching equipment for shad and other semibuoyant eggs	702
LXXIX. (5 and 6) Taking spawn of whitefish, Detroit River, Michigan.....	706
LXXX. (7) Interior of hatchery at Put-in Bay, Ohio. (8) Downing jars set up for use.....	710
LXXXI. (9) Capturing blackspotted trout in small tributary of Grand Mesa Lake, Colorado. (10) Trap for capturing spawning rainbow trout, Lake San Cristobal, Colorado	712
LXXXII. (11) Field hatchery at Grand Mesa Lakes, Colorado. (12) Tray of trout eggs in hatching trough	714
LXXXIII. (13) Series of covered trout-hatching troughs at White Sulphur Springs station, West Virginia. (14) Trout-hatching troughs with Merrill aerating cone.....	718
LXXXIV. (15) Placing cheese-cloth retainers in pond over nests containing bass fry. (16) Pond drawn down and nest boxes placed for spawning.....	720
LXXXV. (17) View of fish-culture station at Manchester, Iowa, showing trout and bass ponds. (18) Preparing a shipment of black bass.....	724
LXXXVI. (19) Main rack across Battle Creek, California, for intercepting spawning salmon. (20) Seining spawning salmon on the McCloud River, California	728
LXXXVII. (21) Spawntaking operations (salmon) at Baird, California. (22) One method of stripping steelhead trout	734
LXXXVIII. (23) Equipment of McDonald automatic tidal boxes for hatching cod. (24) Berried lobsters in course of transfer to hatchery.....	738
LXXXIX. (25) Box of trout eggs just opened after shipment. (26) Tray of trout eggs with mosquito net and moss in which packed.....	742

A NEW PRINCIPLE OF AQUICULTURE AND TRANSPORTATION OF LIVE FISHES:

Plate XC. (1) Floating laboratory and rearing plant from port side. (2) General view from outer rear corner.....	761
XCI. (3) Starboard side, looking aft, inside float. (4) Car with propeller in motion.....	780
XCII. (5) Rearing car raised and held up by portable windlass. (6) Interior of rearing car, and propeller.....	780
XCIII. (7) Lifting disconnected propeller out of water. (8) Propeller removed, showing disconnected shaft.....	780
XCIV. (9) Cleat at end of holding-down plank. (10) Cleats removed, car rising..	780
XCV. (11) Interior of rearing car. (12) Raising car by means of windlass....	780
XCVI. (13) View of interior of a car, showing filter of gravel. (14) Filter car in operation.....	780
XCVII. (15) Filter car, showing bucket chain in operation. (16) Filter car with canvas lining	780
XCVIII. (17) Detail of device for extension and universal movement. (18) Detail of lower portion of propeller shaft and its socket in floor of car.....	780

	Facing page.
A NEW PRINCIPLE OF AQUICULTURE AND TRANSPORTATION OF LIVE FISHES—Continued.	
Plate XCIX. (19) Detail of propeller shaft couplings. (20) Detail of gears on float at junction of transverse and longitudinal shafts.....	780
C. (21) Detail of device for throwing propeller in and out of gear. (22) Operation of device for throwing propeller out of gear.....	780
APPARATUS AND METHODS EMPLOYED AT THE MARINE FISH HATCHERY AT FLÖDEVIG, NORWAY:	
Plate CI. (1) Egg collector. (2) Eccentric wheel providing circulation of water in hatching boxes.....	810
CULTIVATION OF THE TURBOT:	
Plate CII. (1) Turbot eggs with embryo. (2) Larva with vitellus. (3) Larva with vitellus almost entirely resorbed—beginning of critical period.....	870
CIII. (4) Larva a few days after end of critical period. (5) Detail of pigmentation of abdomen of above figure. (6) Larva after critical period....	870
NEW AND IMPROVED DEVICES FOR FISH CULTURISTS:	
Plate CIV. (1) Artificial bass nest. (2) Bass fry retaining screen and trap. (3) Collecting tub, with float.....	1000
CV. (4) Fish retainer, with float. (5) Fish attendant's outfit—aerator screen, plunger, combined ice pick and scuff net.....	1000
CVI. (6) Seine for collecting fingerling bass. (7) Shipping case for fish eggs..	1000
HABITS AND LIFE HISTORY OF THE TOADFISH, OPSANUS TAU:	
Plate CVII. (1) Reproductive organs of the toadfish. (2) Ventral aspect of ripe ovary.	1110
CVIII. (3) One-half of <i>Pinna</i> shell nest, showing live eggs in segmentation. (4) Eggs in late segmentation.....	1110
CIX. (5) Board nest, eggs with late blastoderm and early embryos. (6) Nest showing embryos having marked enlargement at one end.....	1110
CX. (7) <i>Pinna</i> shell nest, showing tadpole-like larvæ. (8) Board nest. Larvæ slightly older than in figure 7.....	1110
CXI. (9) <i>Pinna</i> shell nest, late larval toadfish. (10) Late larval toadfish, showing color markings.....	1110
CXII. (11) Same nest as figure 10. The young nearly ready to break away. (12) From instantaneous photograph of free-swimming young toadfish in water.....	1110
CXIII. (13) Larval toadfish, showing formation of color bands and disappearance of yolk.....	1110
METHODS OF STUDYING THE HABITS OF FISHES AND RECORDING THEIR LIFE HISTORIES:	
Plate CXIV. (1) Water glass designed for observation or photography of objects under water. (2) Two-foot water glass supported on four legs and provided with screen, as used for studying and photographing lampreys.....	1136
CXV. (3) Reflecting water glass. (4) Male of common shiner, photographed in aquarium out of doors.....	1136
CXVI. (5) Photograph of nest of black bass, taken with aid of screen, camera above water. (6) Brook lampreys on nest, photographed through water glass in running water.....	1136
CXVII. (7) Galvanized iron box with plate-glass front, designed to contain camera when used under water. (8) Photograph showing method of using reflecting camera when inclosed in water-tight box for subaquatic work.....	1136
CXVIII. (9) Photograph of nest of a horned dace, taken with reflecting camera and by aid of a cloth screen. (10) Male and two females of horned dace, photographed in aquarium out of doors.....	1136

ILLUSTRATIONS.

IX

	Facing page.
METHODS OF STUDYING THE HABITS OF FISHES AND RECORDING THEIR LIFE HISTORIES—	
Continued.	
Plate CXIX. (11) Male horned dace picking up a stone. (12) Male horned dace about to drop a stone which it carries in its mouth. (13) Male horned dace which has just dropped a stone but has mouth still open. (14) Male horned dace pushing along the bottom a stone too big to carry.....	1136
CXX. (15) Photograph of dace in the act of spawning. (16) Male and female of horned dace just after completion of spawning act.....	1136
INTERNAL PARASITES OF THE SEBAGO SALMON:	
Plate CXXI. (1 to 6) Anatomical details of <i>Azygia sebago</i> . (6 to 10) Anatomical details of <i>Sparganum sebago</i>	1194
STRUCTURE AND FUNCTIONS OF THE EAR OF THE SQUETEAGUE:	
Plate CXXII. (1 to 4) Anatomical details of ear of squeteague.....	1224
AN INTENSIVE STUDY OF THE FAUNA AND FLORA OF A RESTRICTED AREA OF SEA BOTTOM:	
Plate CXXIII. Chart of Vineyard Sound and Buzzards Bay, showing depth and character of bottom at dredging stations.....	1264
CXXIV. Chart showing mean air and water temperature at Woods Hole for each day of the year.....	1264
VOLUMETRIC STUDIES OF THE FOOD AND FEEDING OF OYSTERS:	
Plate CXXV. Oyster with filter apron, for study of feeding.....	1308
PLAN FOR AN EDUCATIONAL EXHIBIT OF FISHES:	
Plate CXXVI. Typical synoptic case used in "corridor arrangement" for exhibition of fishes.....	1340
CXXVII. Section showing gill arches and pharyngeal teeth of the channel bass, illustrating kind of alcoholic material to be used as accessory anatomical exhibit.....	1340
CXXVIII. Mounted and painted skin of long-nosed gar.....	1340
CXXIX. Mounted and painted skin of yellow perch.....	1340
CXXX. One of the cases devoted to the perch group, showing methods of utilizing colored plates and labels.....	1340
CXXXI. General label defining class Pisces	1340
CXXXII. A corner in the fish corridor	1340
CXXXIII. A typical case illustrating arrangement of specimens and method of indicating classification	1340
CXXXIV. A typical case, showing character of material to be used.....	1340
CXXXV. One of the shark cases.....	1340
CXXXVI. Case devoted to the trout group	1340
CXXXVII. A portion of the case devoted to the Haplomi	1340
CXXXVIII. Method of treating large specimens to form frieze above cases.....	1340
CXXXIX. Type of label describing a life habit.....	1340
CXL. Method of treating small fishes.....	1340
CXLI. A method of mounting a single specimen.....	1340
METHOD OF PREPARING FISHES FOR MUSEUM AND EXHIBITION PURPOSES:	
Plate CXLII. Reproductions from photographs of models of black bass, catfish, and lumpfish.....	1355
THE UNITED STATES BUREAU OF FISHERIES:	
Plate CXLIII. United States Commissioners of Fisheries.....	1367
CXLIV. Headquarters of the Bureau of Fisheries, Washington, D. C. Superintendent's residence at a New England trout station.....	1370
CXLV. Marine hatchery and laboratory, Woods Hole. Residence at the marine station, Woods Hole, Mass.....	1374

THE UNITED STATES BUREAU OF FISHERIES—Continued.	Facing page.
Plate CXLVI. Collecting cod eggs on a fishing vessel. Open-air salmon-rearing troughs, Craig Brook, Maine.....	1376
CXLVII. Artificial spawning pond and raceway used in culture of rainbow trout. Interior of a typical trout hatchery.....	1378
CXLVIII. A fish transportation car. Interior of a fish transportation car.....	1382
CXLIX. Deep-sea exploring steamer Albatross.....	1384
CL. Trial fishing on the Albatross. Marine biological laboratory at Beaufort, N.C.....	1386
CLI. Alaskan fish traps and runs used by natives on Chilkoot stream. Salmon trap in an Alaskan river.....	1392
CLII. A Penobscot River salmon weir. Largest seine in the world.....	1396
CLIII. Catching and sorting the brood fish at a trout-cultural station in the Rocky Mountains. Stripping and fertilizing trout eggs.....	1400
CLIV. Salmon hatchery at Baird, California.....	1404
CLV. Fisheries steamer Fish Hawk. Main deck of steamer Fish Hawk, equipped for shad hatching.....	1408
CLVI. Fishery schooner Grampus. The fresh-fish fleet at T Wharf, Boston.....	1412

TEXT FIGURES—PART I.

INTERNATIONAL REGULATIONS OF THE FISHERIES ON THE HIGH SEAS:	Page.
Map showing area delimited by the North Sea Convention of 1882.....	117
Map showing territory covered by the Anglo-Denmark Convention of 1901.....	123
Map showing area designated in the award of the Fur-seal Arbitration Tribunal.....	129
A METHOD OF LOBSTER CULTURE:	
Fig. 1-3. Larval lobsters, lateral view.....	224
4-7. Larval lobsters, dorsal view.....	225
A PROCESS FOR PRESERVING THE PEARL-OYSTER FISHERIES:	
Fig. 1. Plan of tray to contain pearl oysters for radiographing.....	309
2. Longitudinal section of tray shown in figure 1.....	309
3. Conveyer to substitute for tray shown in figures 1 and 2.....	310
GOLDFISH AND THEIR CULTURE IN JAPAN:	
Typical forms of goldfish tails.....	384
COMMERCIAL SPONGES AND THE SPONGE FISHERIES:	
Fig. 1. Hook used by the sponge fishermen of Florida.....	436
2. Dredge, or gangava, used in Mediterranean sponge fisheries.....	487
3. Section of dredge frame, showing bend of iron bar at ends.....	488
4. Transverse struts sometimes used between bars of dredge frame.....	488
A PRACTICAL METHOD OF SPONGE CULTURE:	
Fig. 1 and 2. Showing insulated attachment for lead-covered lines supporting sponge cuttings.....	562
3. Needles used for threading cuttings on supporting wires.....	567
4. Diagram showing average rate of growth of sponges from cuttings of various sizes at Anclote Key.....	571
5. Diagram showing average rate of growth of sponges from cuttings of various sizes at Sugar Loaf Key.....	572
6. Diagram showing comparative increase in volume of an entire sponge and of the aggregate of cuttings from sponges of equal volume.....	575
7. Diagram showing percentages of mortality among different lots of sponges grown from cuttings at Sugar Loaf Key and Biscayne Bay.....	577

ILLUSTRATIONS.

XI

A PLAN FOR PROMOTING THE WHITEFISH PRODUCTION OF THE GREAT LAKES:

Fig. 1. Map of Lake Superior, showing whitefish area.....	Page. 656
2. Map of Lake Michigan, showing whitefish area.....	657
3. Map of Lake Huron, showing whitefish area.....	658
4. Map of Lake Erie, showing whitefish area.....	659
5. Map of Lake Ontario, showing whitefish area.....	660

TEXT FIGURES—PART 2.

FISH-CULTURAL PRACTICES IN THE BUREAU OF FISHERIES:

Fig. 1. Clark-Williamson trough.....	711
2. Plan of barricade in Phinney Creek, near Birdsview, Washington.....	730
3. Front elevation of barricade shown in figure 2.....	730
4. Side elevation of barricade shown in figures 2 and 3.....	731
5. Section on line A-A of figure 2.....	731
6. Detail showing method of fastening racks.....	731
7. Atkins-Dinsmore shipping case, longitudinal section.....	744
8. Same, plan.....	744
9. Same, cross section.....	745
10. Argentine shipping case, section.....	748
11. Same, plan	749
12. German-Chile shipping case, longitudinal section.....	751
13. Same, plan.....	751

A NEW PRINCIPLE OF AQUICULTURE:

Diagram of houseboat and floats [hatching and rearing apparatus]	766
--	-----

A METHOD OF CULTIVATING RAINBOW TROUT:

Diagram 1. Plan of ponds and spawning race.....	785
2. Spawning race, sectional views	786
3. Suggested arrangement of stream.....	786

APPARATUS AND METHODS AT MARINE HATCHERY, FLÖDEVIG, NORWAY:

Fig. 1. Plan of Flödevig hatching station.....	802
2. Spawning pond, plan.....	803
3. Same as figure 2, showing sections	803
4. Device for installation of egg collector.....	805
5. Same as figure 4, showing section.....	805
6. Hatching apparatus.....	806
7. Incubator.....	807
8. Mode of fastening incubator	807

PROPAGATION AND PROTECTION OF THE RHINE SALMON:

Fig. 1. Diagram illustrating sizes of salmon ascending the Rhine.....	822
2. Diagram showing ascent of Rhine salmon in different months.....	823

CULTIVATION OF THE TURBOT:

Fig. 1. Early development of the turbot.....	864
2. Apparatus for hatching turbot.....	867

TREATMENT OF FISH-CULTURAL WATERS FOR REMOVAL OF ALGAE:

Figs. 1 and 2. Apparatus for regulating flow of copper solution	877
---	-----

A DEVICE FOR COUNTING YOUNG FISH:

Measure by means of which to count young fish.....	1003
--	------

A METHOD OF MEASURING FISH EGGS:

Fig. 1. Metal trough for use in determining diameter of eggs.....	1011
2. Portion of diagram showing method of finding number of eggs per liquid quart.....	1014

AN IMPROVEMENT IN HATCHING AND REARING BOXES:

Fig. 1-3. Design of proposed hatching and rearing box.....	1021
--	------

ILLUSTRATIONS.

DEVICES FOR USE IN FISH HATCHERIES AND AQUARIA:	Page.
Fig. 1. Design for artificial pond with siphoid outlet.....	1027
2. A siphoid outlet for hatching and rearing troughs.....	1029
3. Apparatus for cleaning hatching or rearing troughs.....	1031
4. Cleaning device for ponds and aquaria.....	1032
5. Oxygenator and vacuum producer.....	1033
6. Scraper for preparing fish food.....	1035
FISHWAYS:	
Fig. 1. Roberts.....	1045
2. Smith.....	1045
3. Wheeler.....	1045
4. Steck.....	1046
5. Foster.....	1046
6. Rogers.....	1046
7. Bracket.....	1046
8. Swazey.....	1047
9. Brewer.....	1047
10. Shaw.....	1047
11. Atkins.....	1048
12. Richardson.....	1048
13. Hockin.....	1049
14. Cail.....	1049
15. McDonald.....	1050
16. McDonald.....	1050
17. Caméré.....	1051
18. Kirk.....	1051
19. Recken.....	1052
20. Improved Cail.....	1053
21. Adaptation of improved Cail fishway, constructed of concrete.....	1056-1057
HABITS AND LIFE HISTORY OF THE TOADFISH, OPSANUS TAU:	
Diagram showing adhesive disk of toadfish egg.....	1080
METHODS OF STUDYING THE HABITS OF FISHES:	
Fig. 1. Longitudinal section of reflecting water glass.....	1121
2. Reflecting camera, shown in section.....	1123
3. Nest of horned dace, diagram in section.....	1126
4. Diagram showing ceremonial behavior of horned dace.....	1128
5. Male and female horned dace during spawning act.....	1130
AN INTENSIVE STUDY OF THE FAUNA AND FLORA OF A RESTRICTED AREA OF SEA BOTTOM:	
Fig. 1. Map showing Woods Hole region and adjacent portions of New England coast.....	1237
2. Chart showing temperature throughout Buzzards Bay and Vineyard Sound in August.....	1238
3. Chart showing temperature throughout Buzzards Bay and Vineyard Sound in March.....	1239
4. Chart showing density throughout Buzzards Bay and Vineyard Sound in August.....	1240
5. Local distribution of the gastropod mollusk <i>Tritia trivittata</i>	1241
6. Local distribution of the polychætous worm <i>Nereis pelagica</i>	1242
7. Local distribution of the polychætous worm <i>Clymenella torquata</i>	1243
8. Local distribution of the bivalve mollusk <i>Yoldia limatula</i>	1244
9. Local distribution of the sertularian hydroid <i>Thuiaria argentea</i>	1245
10. Local distribution of the common skate, <i>Raja erinacea</i>	1246
11. Local distribution of the "window-pane" flounder, <i>Lophopsetta maculata</i>	1247
12. Showing localities at which the oyster, <i>Ostrea virginica</i> , or its shells, were taken.....	1248
13. Local distribution of the bivalve mollusk <i>Venericardia borealis</i>	1249
14. Local distribution of the actinian <i>Alcyonium carneum</i>	1250

ILLUSTRATIONS.

XIII

AN INTENSIVE STUDY OF FAUNA AND FLORA OF A RESTRICTED AREA OF SEA BOTTOM—Continued.	
Fig. 15. Local distribution of the "whelk," <i>Buccinum undatum</i>	Page. 1251
16. Local distribution of the common scallop, <i>Pecten gibbus borealis</i>	1252
17. Local distribution of the "smooth" or northern scallop, <i>Pecten magellanicus</i>	1253
18. Local distribution of the common purple sea-urchin, <i>Arbacia punctulata</i>	1254
19. Local distribution of the green sea-urchin, <i>Strongylocentrus dröbachiensis</i>	1255
20. Local distribution of the common starfish, <i>Asterias forbesi</i>	1256
21. Local distribution of the purple starfish, <i>Asterias vulgaris</i>	1257
22. Local distribution of the "boat shell," <i>Crepidula formicata</i>	1258
23. Local distribution of <i>Crepidula convexa</i> , a smaller species than the preceding	1259
24. Local distribution of the hermit crab <i>Pagurus longicarpus</i>	1260
25. Local distribution of the hermit crab <i>Pagurus pollicaris</i>	1261
26. Local distribution of the hermit crab <i>Pagurus annulipes</i>	1262
27. Local distribution of the hermit crab <i>Pagurus acadianus</i>	1263
GASES DISSOLVED IN THE WATERS OF WISCONSIN LAKES:	
Fig. 1. Sketch map of Wisconsin, showing lake districts	1276
2. Lake Mendota. Chart showing vertical distribution of gases, carbonates, and temperature, January 26, 1906	1277
3. Lake Mendota: Same, February 25, 1906	1278
4. Lake Mendota. Same, March 29, 1906	1279
5. Lake Mendota. Same, April 8, 1906	1280
6. Lake Mendota. Same, May 4, 1906	1281
7. Lake Mendota. Same, May 22, 1906	1281
8. Lake Mendota. Same, July 2, 1906	1282
9. Lake Mendota. Same, August 1, 1906	1283
10. Lake Mendota. Same, October 8, 1906	1284
11. Lake Mendota. Same, October 11, 1906	1285
12. Green Lake. Same, October 4, 1906	1286
13. Lake Geneva. Same, September 26, 1907	1287
14. North Lake, east part. Same, July 30, 1906	1288
15. Thousand Island Lake. Same, August 13, 1907	1289
16. Stone Lake. Same, August 22, 1907	1289
17. Beasley Lake. Same, August 4, 1908	1290
18. Otter Lake. Same, August 4, 1908	1290
19. Silver Lake. Same, August 21, 1907	1291
20. Hammills Lake. Same, August 17, 1908	1291
VOLUMETRIC STUDIES OF THE FOOD AND FEEDING OF OYSTERS:	
Fig. 1. Design of water-specimen cup, elevation	1300
2. Same, section	1300
3. Same, cross section at A, figure 2	1301
4 and 5. Same, details of tripping device	1301
6. Apparatus for extracting contents of alimentary tract of oysters	1305
PLAN FOR AN EDUCATIONAL EXHIBIT OF FISHES:	
Fig. 1. Plan of fish hall in American Museum of Natural History, illustrating "corridor method" of arranging cases	1320
2. Example of family label	1321
3. Example of popular label for individual specimens	1322
4. Example of descriptive case-label defining a suborder	1324
5. An accessory label to illustrate a biological phenomenon	1325
6. Plan showing hall adapted to the "alcove arrangement" of cases	1326
7. Diagram of fish case to be used in hall with "alcove arrangement"	1327
8. Plan illustrating "gallery arrangement" of fish exhibits	1328
9. Sketch illustrating combination of pictorial fish groups with synoptic method of exhibition	1329